



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

JOURNAL

OF

THE ROYAL ASIATIC SOCIETY.

ART. I.—*Sketch of the Topography of East and West Berar, in reference to the Production of Cotton.* BY CAPTAIN MEADOWS TAYLOR.

THE present province of Berar has been materially altered since its first cession by His Highness the Nizam, under the Treaty of 1853. It then consisted of two districts, called North and South Berar; the former being bounded to the north by the Satpoora mountains, and to the south by the hills which form the southern face of the valley; to the east and south-east by the Wurdah river, and to the west by the British province of Khandesh, belonging to the Presidency of Bombay. It was about 150 miles long from east to west, and from 40 to 60 broad, containing an area of about 7,500 square miles.

South of this tract was an irregular portion of country, bounded to the east and south-east by the Wurdah river, to the south and south-west by the Peyu Gunga, a tributary of the Wurdah, which in fact formed the boundary from its source to its junction with the Wurdah—which was termed South Berar. It was of a somewhat greater area than the northern province, or exceeding 8,000 square miles; but had a worse soil, thinner population, and was altogether inferior in value, yielding a revenue very much less in proportion to area than North Berar,¹ and requiring, in many respects of revenue and police jurisdiction—larger establishments.

The northern province consisted of two “Sircars” or ancient geographical divisions, provinces as they may be termed: Gawil-

¹ The proportion was about 8 to 15 lacs.

gurb to the east, Narnalla to the west. These portions were pretty nearly equal, and were divided by a line taken due south, or nearly so, from the fort of Gawilgurb. It appeared most convenient, therefore, that this line should be prolonged till it met the river Peyn Gunga, and the provinces east and west of it were called East and West Berar. This arrangement was made in 1860-1, and still remains. East Berar, therefore, consists of Sirkar Gawul, with that portion of Sirkar Mahore which lies north of the Peyn Gunga. West Berar, of Sirkar Narnalla, and Maikar, and that portion of Sirkar Bassim which lies north of the same river. The Pergunna Nursec, which lies south of and adjoining Bassim, was doubtful when I last heard from India; but I rather think that the river boundary, though irregular in contour, will be preferred to one which has no particular indication.

I need not refer particularly to the terms of the Treaty of 1853, further than to state, that a certain sum, say 50 lacs of Hyderabad rupees per year, were required to pay the Nizam's contingent, the interest of his debt to the Company, and some Mahratta claims and stipends for which we were guarantee under the Treaty of 1822. Should any surplus arise, it was to be applied to the gradual redemption of the debt. To make up the sum required, four frontier districts were transferred to British administration, namely, the two Berars to the north, the district of Nuldroog, or Daraseo, as it was afterwards called, to the west, and the Raechore Doab to the south: the aggregate estimated revenue of which was Hyderabad rupees 52 lacs, or thereabouts. From 1853 to 1860, however, this amount had increased very considerably, under a great extent of cultivation; and it might in any case have been a question whether we were justified in holding a greater amount of revenue than was actually needed for purposes of payment. When, therefore, a suitable acknowledgment of the Nizam's good faith during the rebellion became necessary, it was determined, among other benefits to be conferred, to cancel the old debt altogether. This, of course, reduced the demand to provision for the payment of the contingent and the Mahratta stipends only; and there was no resource but to resign to the Nizam as much of the territory first assigned to us as was superfluous to our actual requirements.

A new treaty, in 1860, or rather a revision of the old one, arranged this in a definite manner. His Highness received from us, in free gift, the principality of Shorapore, which had proved unfaithful, and had been conquered, and the districts of the Raechore

Dooab and Daraseo were entirely relinquished to him. Now, in the provinces of North and South Berar, as in the other provinces under the first Treaty, certain portions and villages, which had belonged to the Nizam himself, or to the Prime Minister, or to noblemen or others, by special grants in former times, were retained under the independent revenue management of the several parties by the title of *Sarf-i-Khas*. This separate and divided jurisdiction was found very inconvenient in many respects; and under the new arrangement, and in consideration of what he had received back, as well as to make up the amount required for the future payments of 30 lacs per year, the Nizam relinquished all the *Sarf-i-Khas* territory in North and South Berar, ceding also, in perpetuity, a portion of territory upon the Godavery which was necessary in order to provide for the navigation of that river.

I need not detail the various items of *Sarf-i-Khas* territory so transferred; suffice it to say, that the whole of both provinces of Berar is now assigned to us, those isolated villages only excepted which were held in *Jahgeer* or *Inam* under former grants by the Nizam and his predecessors, and which were guaranteed to the holders under the provisions of the first Treaty. These, however, are comparatively few.

The accompanying tracing from Major Scott's map, which is itself a reduction from the Trigonometrical Survey Map of India, shows the provinces of East and West Berar as they now exist. The dotted line south of the *Peyn-Gunga* shows also the position of the *Pergumna* of *Nurse*, which was held up to the Revenue year 1861-2, but about the ultimate disposition of which I am now uncertain.

These provinces may be better described, as far as the topography is concerned, under the old division than the new; for the features of what were North and South Berar differ very materially, as well as the quality of their soils in relation to the cultivation of cotton.

North Berar, as I have said, comprised the *Sircars* of *Gawil* and *Narnalka*. To the north, the *Satpoora* hills rise to a height of 3,000 to 3,800 feet above the sea, or from 2,200 to 3,000 feet above the valley. The ridge is narrow and irregular, descending to the *Taptee* on the north, in deep ravines clothed with dense jungle, in which teak to some size is found, the whole tract having a very sparse population of "*Gonds*," and "*Gowlees*" (herdsmen), and but little cultivation. The descent to the valley on the south side is more abrupt, the mountains having steep scarped faces of prismatic

basalt, and the culturable soil is met with close to the ends of the spurs which, thickly wooded, descend into the plain. The mountains are exclusively of basalt; but eastwards, from near Ellichpoor, sandstone is met with through which the basalt has burst, at the period of the elevation of these mountains, as appears by the distortion of the sandstone strata and their partial vitrification when in contact with the basalt.

On the south side of the valley, the elevation of the hills is not so great, not exceeding 800 feet, at any point; nor is the ascent so abrupt. It is, in fact, the summit of one of the great Deccan plateaux, and descends to the valley by a series of steps on the north side, sloping very gently to the Wurdah and Godavery on the south and east.

The valley between these ranges has a very rich soil of great depth. Towards the hills on both sides it becomes shallower, and rests upon the basalt, which here and there crops out above the surface; but towards the centre of the valley no rock whatever is met with, and the banks of the Poorna River show escarpments of pure black soil of from 30 to 50 feet deep, while in the salt wells of Dehunda, nothing but black earth and yellowish clay is met with to a depth of 120 feet.

The whole of the valley is available for cotton cultivation. Although the soil towards the hills on both sides is gravelly, occasionally even stony, yet the crops of cotton are as fine, if not indeed finer than those on purely black soil in the centre of the valley; but the gravelly soils require a different species of cotton which has not quite so high a value as that grown upon the purely black soil, though, if the season be favourable as to rain, the produce is much larger.

In the attached map, I have endeavoured to show the areas of cotton-producing lands on both sides of the valley of North Berar; the grey colour denotes the gravelly soils, which are composed of nodules of trap and of fine kunker, mixed with coarse agates, chalcedonies, &c. It is often shallow and very light in quality, not retaining moisture; but the better qualities are a rich brown loam, resting upon beds of kunker, or, with the shallow portions, upon the basalt below. Thus, in North Berar, as the centre of the valley is reached, the substratum rock is found at a greater and greater depth, till it disappears as far as 120 to 140 feet, and the deep beds of black soil or reger are found to be resting upon yellowish and greyish white clays intermixed with beds of gravel. These portions are coloured yellow.

The soil of the southern portions of both provinces—what in fact constituted the former district of South Berar—is very different, and for the most part is unsuited to cotton cultivation, of which, comparatively speaking, there is very little. The soil near the top of the plateau is much denuded, and comparatively very shallow, except in the low bottoms of the narrow valleys, where occasional fields of cotton are met with. Where the soil however is good, grain grows better than cotton, for which perhaps the climate is too harsh; and I have observed in all the high plateaux of the Deccan, that cotton grows indifferently, is uncertain in produce, of a rough staple, yields comparatively small returns per acre, and, in fact, is grown more for local consumption than for exportation. This, perhaps, results from the comparatively high elevation of these plateaux. North Berar, which is essentially a cotton-producing district, has an elevation in the valley of from 800 to 900 feet above the level of the sea, whereas the plateaux lying to the south is from 1,600 to 2,000 feet. North Berar is a very moist, damp climate. South Berar, on the contrary, dry, and more uncertain as to falls of rain than the northern districts.

On all the small hills in the southern part of the district a low scrubby jungle prevails, and grows on a soil which is unfit for agriculture of any kind; and as these hills cover a very large proportion of the area, the population is proportionably sparse. On the Wurdah, south-east of Oomrawutte, there is a good deal of fine grass-land, all waste, with hardly any population, which might possibly be available for cotton to some extent. It would be difficult however to induce people to settle on it and to build new villages, or even to break up lands which have been so long waste. I have coloured this portion of the tract green, and the rest, in which cotton grows only partially, yellow. The original boundary of North and South Berar, which is in fact the line of hills, is marked with dots, for the sake of distinguishing the old arrangement and the difference of the two provinces.

There are two kinds of cotton in North Berar, Jhurree and Bhunnee. The former, Jhurree, grows upon the richest and deepest soil; the Bhunnee, on the more gravelly. The fibres of these two kinds are essentially different. Good Bhunnee, which is a pure white in colour, and is perhaps most esteemed in native manufactures, has a crisp strong fibre, the native test being to squeeze a portion in the hand close to the ear, when a slight crisp sound is heard. Jhurree, on the contrary, is soft and silky, and is perhaps somewhat weaker in staple. It however commands the highest

price for the foreign market. Both species bear very prolifically in good seasons and attain a considerable height; and having once had occasion to collect specimens of cotton plants, large and small, for transmission to America, I find, from my memoranda, that the following were the results:

The average height of twelve plants of Bhunnee cotton was 5 feet 6 inches.

Of eleven plants of Jhurree cotton, 7 feet 3 inches.

The average spread of branches from the stem in the above, Bhunnee, 1 foot 10 inches; Jhurree, 2 feet 4 inches.

I find that as many as 321 pods and flowers were counted upon one plant of Jhurree as a maximum, and that averages of plants of all sizes were as follows:

Jhurree, 12 plants, 126 buds, flowers and pods.

Bhunnee, 12 do. 82 do.

Jhurree produces more prolifically than Bhunnee, but the pods of Bhunnee are larger.

This proves how luxuriously the plant flourishes in Berar. The amount of yield is also satisfactory, and I give the following averages as the result of Panchayets assembled in every Talook of the district, composed of the most wealthy and intelligent farmers that could be found.

First quality crop, *cleaned* cotton, per beegah of 3,600 square yards, 45 to 60 seers, or 90 to 120 lbs.

Second quality crop, 35 to 40 seers, or 70 to 80 lbs.

Third quality crop, 20 to 25 seers, or 40 to 50 lbs.

Newly ploughed virgin soil is however known to yield from 130 lbs. to 150 lbs. per beegah, which would be the maximum. The beegah may be taken at two-thirds of an acre, so that the produce above given, would be 120 lbs. to 160 lbs. first quality—85 lbs. to 105 lbs. for second—and 53 lbs. to 66 lbs. for third quality, per acre; while exceptional returns may run as high as even 200 lbs. per acre.

In the eastern portion of Berar, and along both sides of the valley, where the soil is light, and will bear irrigation from wells, a good deal of garden produce, such as turmeric, ginger, yams, &c., is raised—the two former for exportation; as also sugar-cane for local consumption, which is necessarily large in so well populated a district. These are annual crops: and by way of rest to the land cotton is sown intermediately, followed by grain, before the land is re-manured and re-irrigated. It is in these lands that I have seen the finest crops of Jhurree cotton. The farmers say that the plant will not bear direct manuring, or too exciting a soil,

because it runs to wood, and becomes weak, which is true; but manured land, which has borne a crop, and has had water applied to it during the whole or most part of a year, is decidedly the best suited for Jhurree cotton; and some of the fields I saw, of this description, in 1857 and 1858, must have yielded returns far higher than the results given by the punchayets, which I am inclined to think underrated—the *average* being 60 lbs. to 83 lbs. per beegah, or 80 lbs. to 100 lbs. per acre, *only*.¹ The land is, however, naturally so rich that manure of the lightest description is preferred, such as the sweepings of cattle sheds, and refuse forage, intermixed with some cow-dung in the rainy season, when cakes for burning cannot be made. It is laid on in heaps, spread over the ground, and worked in with the hoe, before the rain falls. Manure is only applicable to the lighter soils; the heavy reger, or black soil of the centre valley, does not require it; indeed, if applied, it has the effect not only of exciting the soil too much, but of disintegrating it and making it too friable. Virgin soil, cleaned and well ploughed with the heavy subsoil Mahratta plough, is good for from ten to fifteen years. The surface hoe, or light plough, being used only to clear away stubble and prepare it for sowing. After that period, a perennial grass, called Hurralee, begins to infest it, and gradually overspreads it in a few years more. The farmers then allow it perfect rest for two years if possible, and repeat the old subsoil ploughing with the same result as before. At present a great proportion of the central area of Berar, from east to west, is entirely new cultivation. The former dense Babool jungles have almost all disappeared, and given place to cotton and wheat crops of surprising luxuriance; and I question, at the rate at which cultivation has extended since the transfer of Berar to British management, whether any waste land will soon be procurable. The province, indeed, is rapidly attaining its maximum rate of production.

It must be remembered, however, that Berar must always require the production of a large quantity of grain, and that all its lands, or even an unusual proportion of them, cannot be applied to cotton

¹ In a report by Colonel Cuthbert Davidson, C.B., resident at Hyderabad, on the soil and products of Berar, and on estimate of the cost and returns of a beegah of cotton— $\frac{1}{2}$ candy or 30 maunds of cotton is given as the produce per *beegah*. This, at 12 seers to the maund, would be 360 seers = 720 lbs. of uncleaned cotton, or 480 lbs. of cleaned, which appears very large, so much so as to be doubtful. At this rate the produce per acre would be 640 lbs., which is greater than any American return!

cultivation. I have before remarked that the population of North Berar is unusually large in reference to the rates per square mile for Central India generally, and there is no question that it increases. Now Berar cannot import grain, because all around it the production only suffices for local consumption, hardly indeed for that. To the north are the mountains and jungles of the Satpoora range; to the east Nagpoor, which only grows enough for its own consumption; to the south a partly unproductive country till the Godavery is approached, and the grain from thence is sent to Hyderabad. To the east is Khandesh, any surplus from which goes to Bombay. There is not, therefore now, and there never can be, any material import of cereals into Berar, which, throughout, produces grain in large quantities.

It is always difficult to estimate the actual proportion of cotton cultivation to that of cereals, and I regret to state that I cannot obtain it from Berar in time to give it with this paper, even if it be obtainable there; but an approximate calculation of probable produce of cotton may be made as follows. I make the estimates for the former divisions of North and South Berar separately, because of the great excess of non-productive land in the latter over the former, and the comparatively small area of cotton-producing land in what is culturable.

I have assumed the total area of North Berar to be 7,500 square miles, of which 1,500 being set off as an estimate of unculturable wastes, and lands unfit for cotton cultivation, 6,000 square miles, or 3,810,000 acres remain, of which, say that one-fourth, would be the maximum sum of cotton cultivation, or 960,000 acres, which, on the previous average of 90 lbs. of cleaned cotton per acre, would afford a gross produce of 86,400,000 lbs. Now, assuming the population to be one million, and the local consumption to be at the generally estimated rate of 12 lbs. per individual per year, a residue of 74 millions of pounds would result.

Again, in relation to South Berar, which has an area of about 10,000 square miles, a more unfavourable comparison must result from the fact of the unculturable waste lands being so extensive in comparison with lands available for agriculture; but if one-fourth be culturable land, we have 2,500 square miles, or 1,600,000 acres, of which one-eighth may be fit for cotton growing, or 200,000 acres; but the produce might not exceed 50 lbs. per acre, or 10 millions of pounds, and if the population be 400,000, 4,800,000 lbs. of cotton would be required, which would leave 5,200,000 lbs. as the available surplus only.

In all, therefore, 80 millions of pounds may be the total producible quantity from both districts, or, as they are now arranged, of East and West Berar.

It is fair, however, to give an estimate made by one of the former assistants in the province of South Berar, and the truth may lie between the two. He estimates the whole province as:—

	<i>Square Miles.</i>
East Berar, area	10,500
West Berar	9,000
Total	19,500

Of which about one-fourth is *cultivated* (not culturable) land, or 4,750 square miles, or 3,040,000 acres; and of this one-eighth as sown with cotton, or 380,000 acres; which, at an average of 70 lbs. per acre, would yield 26,600,000 lbs. of cotton. Then, if the consumption of 1,400,000 people be deducted, at 12 lbs. per head per year, there would be a residue of, say 10 millions of pounds only, which I should think considerably *below* the mark, and an average, perhaps, of the two, or, say 42 or 50 millions of pounds, may be nearer an actual result.

It is, however, next to impossible to estimate the producing capabilities of Berar, East or West. The land has not, as yet, been classified or surveyed, and until that is done, the area fit for cultivation cannot be known, much less what is fit for cotton sowing. I have no doubt that the actual area estimated to be sown with cotton this year will be obtainable from Berar, and when I receive it, I shall do myself the pleasure of forwarding it. With it also will be sent an estimate of produce calculated on the most recent returns of produce that may have been obtained.

There are, at present, two principal cotton marts in Berar, Oomrawutte and Khangaon. Of these, Oomrawutte which has been made the civil station of East Berar, has always been a considerable place of trade, being an entrepôt for spices, salt, and coast produce in general, as well as for export of cotton and other local produce to the coast, as well as to Mirzapoor. Oomrawutte is well situated on a gravelly soil, near a small range of hills which are an offshoot from the southern range, and is marked as being 928 feet above the level of the sea. All the produce of the Pergunnas of Bunnera Beebee, Soorjee Anjengaoim, Ellichpoor, Toogaom, Durriapoor, Chandore, Kolapoor, Nandgaom, Mungrool, Koora, Tulligaom, Dusheshwur, Hewurkheir, Buroor, Morchee, Sur-rusgaom, Manna, Joosoo, and Mortuzapoor, is taken to Oomrawutte;

as well as much of the produce of those Pergunnas of Nagpoor which lie on the left bank of the Wurdah, and even of those further to the eastward.

Khangaoon is situated about 80 miles to the westward of Oomrawutte. It has not the same amount of import trade, but is a considerable entrepôt for local produce which is exported to the coast, both cotton and linseed, with madder, sesamum, and other productions in demand at Bombay. It collects the produce of the western Pergunnas of North Berar, namely, Akola, Argaom, Jamode, Julgaom, Bunneria, Mulkapoor, Balapoor, Akola, Dehinda, and Pannajee. Some cotton, linseed, and sesamum also reach it from Maiker and other Pergunnas, above the southern hills. The station of the West Berar district has been fixed at Akola, which is more central than Khangaoon, and as the railway will touch it, I have no doubt that Khangaoon will decline, or, at least will not increase.

There are other cotton marts, but of a more local character, at Balapoor, Akote, and Mulkapoor, in West Berar; and Ellichpoor, Hewurkheir, Morehee, and Surrusgaom, in Eastern Berar; but I am inclined to think there is no direct export, except from the great marts of Oomrawutte and Khangaoon.

To the east of the Wurdah river, in the province of Nagpoor, there are large cotton-producing tracts, and the Pergunnas of Mangaom, Andoree, Wyegaom, Khangaoon, Natchengaom, Deolye, Ponar, Kelsee, Sindee, Bela, and Hingunghat, are as famous for their cotton as any part of Berar. These Pergunnas supply the market of Hingunghat. Another mart in the Nagpoor territory is Aroee, which collects produce from the Pergunnas of Aroee, Seyloo, Ashtee, Annair, and Kondalee. Most of this cotton goes to Mirzapoor, as more profitable for export, perhaps, than Oomrawutte and Bombay; but the railway which will traverse the cotton-producing Pergunnas of Nagpoor, lying between the Wurdah and that city, will no doubt convey the whole of the Nagpoor as well as the Wurdah Valley produce to Bombay. The produce of Nagpoor which does not go to the west coast by the Berar Valley, or to Oomrawutte, &c., is sent direct from Hingunghat *via* Bassim, Jahna, and Ahmudaugger, to Bombay, but it is not very considerable.

From the above I think it may be safely assumed that agencies might be established with great advantage at Akola and Oomrawutte, with branches about the country. For instance, for Oomrawutte, a branch at Ellichpoor, which is a cantonment of the

Hydrabad Contingent, would gather produce from Anjengaom to the west and Surrugaom to the east.

A branch at Hewurkheir or Morchee, would gather supplies from Burroor, Morchee, and Hewurkheir.

A branch at Hingunghat would supply produce from the Nagpoor country's districts lying on the left bank of the Wurdah.

A branch at Karinjah, and one at Bassim, would drain the southern districts.

So also, a minor agency for West Berar at Akolah, which, as the civil station and upon the railway, would be preferable to Khangaom, and could have branches at Akola, for Akote, Argaoim, and Bunnara:—At Mulkapoor, by which the railway will pass, for Peepulgaom, Jamode, Mulkapoor, and Rohunkher, while Akolah would command Balapoor, Dehunda, Punnagee, Warroor, and other central Pergunnas. An agency at Maiker, above the Southern Hills, would also obtain produce, but the country is not rich.

Thus both *general* agencies would be situated upon the railway, and in communication with the best cotton districts of East and West Berar, and would also communicate with the southern portions of those districts which lie south of the range of Southern Hills, and with Nagpoor.

Though cotton might be the main object of a Company's enterprise, it is by no means to be supposed that the produce of Berar is confined to that article. On the contrary, I know of no district in which such varied productions are grown, or which is better suited by soil and climate, to all descriptions of Indian staples.

The whole of the northern and southern sides of the valley where water is near the surface, and soil is of mixed quality, produces ginger, turmeric, sugar-cane, and all other irrigated crops in great variety and luxuriance. The soil is naturally rich, and the water in the wells is near the surface. The Pergunnas in which irrigated produce is grown to the north, beginning from the eastern side, are,—Burroor, Morchee, Hewurkheir, Anjengaom, Akote, Julgaom, Argaoim, Jamode, and Mulkapoor. On the south side of the valley, Tulligaum, Mungloor Peer, Karinjah, Ballapoor, and Peepulgaom. In all these localities which, from the quality of the soil, allow of irrigation being applied to agriculture, much might be done to preserve the water which at present flows to waste, by collecting it in tanks, or lakes, and making dams upon the small rivers. Such works would be within the proper province of the Company; and, to judge from the results and experiments elsewhere, in the province of Golcondah, for instance, would prove very renu-

nerative, both for the sale of the water to the people and the great stimulus they would give to irrigated produce.

In the course of a report made by me to Government upon the feasibility and necessity of providing water for agriculture in the province of Daraseo, then under my superintendence, I showed by a series of calculations founded on returns furnished by *every* collector of *every* province in the Bombay Presidency where irrigation existed, as well as from the Commissioners of the remaining three districts of the Hyderabad Commission, that the average cost of watering an acre of ground per year for sugar-cane, or any crop which requires water for a whole year, was thirty-seven rupees and a-half. The returns were obtained by punchayets of respectable farmers which sat in every talook, and the aggregate of talooks and their average was transmitted by the collector. The expense included proportions of cost of bullocks and repairs of well, feed of cattle, gear for raising water, rope, leather bucket, &c., ironwork, wages of men—the one to drive the cattle, the other to turn off the water, and the like. Now the cost of water per acre per year is about three rupees on the Ganges canal, and varies from three rupees to twelve rupees per year from tanks and dams in the Madras Presidency, according to number of crops irrigated. In the Daraseo districts, the people would have given six rupees per acre per year gladly for water, and no wonder, if they were spending thirty-six. On an occasion of a proposed “anicut” from the river Tumboodra in the Raachore Doob, which was under my charge in 1859 and 1860, Government was offered eight rupees per acre for water on *each* crop of rice on land of first quality, or from sixteen to twenty-four rupees per acre per year. It was proved also, on data which admitted of no question, that by construction of lake or tank dams, water could be stored, to be sold at a profit, and so as to supply irrigation, at the rate of *two rupees per acre per year*, and even less.

As I have before stated, the sides of the valley of Berar, might be provided with water to a great extent by damming up the small rivers, and storing up the monsoon overflow; but, beside this, there is the Wurdah, by which, at one spot where it falls precipitously about thirty feet, and continues to fall by rapids for nearly a mile, or in all, probably, from eighty to one hundred feet, a head of water could be obtained which would irrigate the whole of the right bank as far as the water would last; and my impression also is, that if a *system* of dams, one below another, built on natural ledges of rock, as is the case in the Tumboodra, were constructed, much

of the waste unproductive tract of land lying on the right bank of this river, south-east of Oomrawutte, would be rendered very valuable. That tract, now quite or nearly uncultivated—except by a few Gonds, and used only for pasturage by wandering herdsmen—might be purchased by a company, or rented on very favourable terms, and the application of irrigation to it would at once attract a large population. I cannot say for certain that the plan is as feasible as it appears, but of the perfect possibility of putting the whole of the water of the Wurdah to use from the spot I have mentioned, which is a few miles below the Kasba Annair, in the Burroor Talook I have no doubt, as I inspected the locality with great minuteness and for the purpose of reporting upon it, in 1858; and it is impossible but that the natural descent of the river per mile, and of the country with the river, should not furnish localities for the construction of dams to command the lands below them from spot to spot, according with the natural levels. This is the system pursued in all the rivers of the south of India, and except where the channels of the rivers are too deep to admit of it, or ledges of rocks with strong banks are not found, there is nothing, in my opinion, to prevent the water of Berar, or elsewhere, being used in a similar manner. It is, however, hopeless to expect Government to construct such works, and it is under the formation and operation of companies alone that they could be executed efficiently or worked profitably.

I think this will not be considered a digression from the subject of Berar topography and production, for it is in reality one of the greatest importance to the district. Irrigation is not applicable with any good effect to cotton cultivation, and experiments have been made which prove this beyond a doubt; but the value of sugar, tobacco, indigo, ginger, turmeric, and the like is far beyond that of cotton as a crop to the farmer, and, I should think, to the merchant also; and irrigation is necessary to all these and others. In any case, they would combine with cotton, sesamum seed (Till), linseed, and mustard seed (the demand for each and all of which has been very rapidly increasing for some years past), rape, castor oil, sallower and its seed, hemp, and other local produce required for exportation to the coast for Europe or other countries.

There is yet another subject to which I beg to be allowed to attract attention, as I think it is feasible to effect much by a little pains. I allude to the manufacture of flax from the linseed plant. The fibre may not be very long; but it will be fine, and machinery for spinning flax has been so improved of late years, that anything

a few inches long can be spun into excellent yarn. I have made several trials myself with success, and the Berar flax, growing more luxuriantly and more succulently than the flax of the Deccan usually does, yielded fibre with comparatively little trouble. Government officers, however, distracted with other business, obliged to be continually moving at the season when flax is ripe, and unable to obtain proper instruments, or to direct the process in a fitting manner, can only make very partial experiments; but a company, whose business it would be to perfect all existing productions as much as possible, might pursue the subject of flax with, I should think, much advantage. Thousands of tons must now be destroyed simply from the inability of the people to make flax, indeed, from their absolute ignorance that any fibre can be obtained from the plant, which is burned, lest cattle should eat it and be poisoned. In the Punjab, flax has already become a staple product for exportation to a considerable amount, and I have no doubt that the same result would follow in Berar, were its production systematically undertaken.

I return, however, to cotton.

It has been proved that the American species of New Orleans or Upland cottons, sown in the Deccan at Dharwar, the Raecchore Doab, Shorapore, and other localities, produce a staple as good, or nearly so, as that obtained from America. There is a slight difference in the present market price, but for the most part they range within a penny a pound of each other, the "Ginned Dharwar" having the preference in some cases. I myself had a large share in the experiments by which New Orleans seed was cultivated in the Deccan, and have seen enough of its cultivation to be assured of its not only maintaining its ground against the indigenous varieties, but of surpassing them in every respect. The acclimatized New Orleans is a hardy plant, rarely affected by the dry, withering north-east winds which so often ruin the produce of the indigenous variety; it requires no particular cultivation: no manure if sown in good black soil: is a heavy bearer, certainly one-half more than native under all circumstances, and more frequently double. It also gathers far less dirt, and the leaves being of a firmer and less friable nature, do not break in gathering the produce, as those of the indigenous varieties do, and become mixed with the wool so inextricably I am informed, that the more the wool is separated, the more are the particles of leaves broken and diffused. The proportion of wool to seed is also greatly more—nearly one-third; while, as is well known now, it not only commands a greatly

enhanced price in the market over the indigenous, but is adapted, by the length of its staple, to the use of manufactures in those spinning machines which are adjusted for American cotton without any special adjustment for itself.

This plant requires no special cultivation, nor was it till exactly the same mode of treatment was adopted with it, as was customary with ordinary cotton, that it succeeded at all. The American plans of sowing in partitions, upon ridges, in square holes, and the like, difficult of execution and involving much manual labour, would never—*could* never have been adopted by the Indian Ryot; and it was the practical Deccan farmers, at Dharwar, who, after seeing the real value of the plant, rejected the American system as too complicated, and in reality not suited to the climate because creating too much evaporation, and treated it in their own way with perfect success. This plan was adopted by me in the Shorapoor State, which is not far north-east from the Dharwar boundary; and the plant was becoming a favourite crop, when I was transferred to other duty in 1853. Upon its introduction into the Râcchore Doab, which borders Dharwar and Shorapoor, it was rapidly increasing in demand and in favour when I left the district in 1860; but, I fear, as that province has been retransferred to the Nizam, that the cultivation will not be carried on so carefully—that is, without mixture of native varieties—as it was before. A want of seed was the only difficulty in 1859-60; if it had been procurable in time, a very much larger breadth would have been sown than was sown.

Now, I think this kind of plant would, after a few trials, succeed perfectly in Berar. The only objection to its cultivation in the Deccan generally is, that the climate and soil are too dry, and that if sown at the time the ordinary cotton is sown, it dries up before the produce is complete.

It must be understood here, that both the indigenous kinds in Berar, Bunnce and Jhurree, bear but one crop of flowers and produce. Some of the buds flower and form into bolls a little later than others, as might be expected on any annual plant, but there is not more than a fortnight's difference. Now, the New Orleans variety comes into flower earlier than the native plant, and bears a constant succession of flowers and bolls till the end of the hot season. The plants, particularly the hybrid varieties of the Sea Island, would, indeed, answer well another year; but they require pruning, and the crop is perhaps less prolific than that of the first year, and more liable to attacks of insects.

But great drought is not a characteristic feature of Berar; in fact, almost the contrary. It has a moister climate all the year round than any part of the Deccan with which I am acquainted, and a more unvarying supply of rain. The monsoon rarely gives less than 30 inches; sometimes, indeed, much more; and whereas for the last twenty years the average of the Deccan would not, perhaps, amount to 20 inches, certainly would not exceed it—the average of rainfall for 1855, 1856, 1857, in Berar, was 30·75 inches, and they were barely average years, and when other portions of Western India were sorely afflicted with drought. The moisture in Berar, therefore, may be attributed to the retention of the monsoon fall by the deep tenacious soils of the district, and consequent heavy evaporation afterwards, which tempers the dryness of the air, and makes it so favourable to the production of the indigenous plant; for nowhere in the Deccan proper, or in Dharwar, are such crops seen as ordinarily exist in Berar in all its localities.

From this I assume that the cultivation of the American plant would succeed if *properly* tried. I am aware that some attempts have been made which failed; but during the time I had charge of the province, I could not discover that any proper trial had ever been made, or that any one was particularly interested in the subject. American and other varieties of *imported* seed had been sent to the province, which, in most instances, had failed to vegetate; in others, had come up so sparsely, that its failure was attributed to the quality or condition of the soil or climate. The native farmers, therefore, were disappointed, and declined further experiments; the Government officers were none of them agriculturists, or cared very much about the matter in any way; and so the first trials being as unsuccessful as they had been in many other localities—at Dharwar and Shorapoor for instance, further efforts were abandoned altogether. Yet in 1857–58, I saw, in some localities, individual plants and patches of New Orleans cotton as fine as any I had experience of in Shorapoor, if not, indeed, finer; and were fully acclimatised seed used, and PERSEVERED IN until the proper treatment of the plant was ascertained, I should anticipate a certain success.

It would be a great object of any Company to make such trials. Land sufficient for the purpose *in different localities* and of different qualities, could easily be rented from Government, or waste land could be taken up and cleared for the purpose. Acclimatized seed can be obtained in Dharwar to any amount, and I would advise trials with this seed, which, so far as my knowledge goes, *has never*

yet been tried in Berar. It was my intention, had I remained in the province, to have got up seed from Dharwar in time for the early sowings in June, and I would have tried them in all the Pergunnas of Berar and on all kinds of soil,—the deep black, the mixed loams, and gravelly soils; and those soils on which irrigated produce—sugar-cane, ginger, and the like—had been grown the year before. All these should be attempted, and the results carefully noted. If the seed failed partially, or even entirely in some places, fresh seed from Dharwar should be obtained; but if any plants succeeded, even partially, that seed would be more valuable than any other for the next year's growth.

If the seed were sown in the loamy or gravelly soils of the *sûles* of the valley, near the hills, the earlier it was put into the ground, the better; say as soon in June as the moisture admitted, at the same time, indeed, as the indigenous varieties. But in the very deep black soil of the centre of the valley, the seed might be sown, as it always is in Dharwar and Shorapoor, in August. It would ripen later, but it would be a stronger plant, less liable to heating and casting its bolls, than it is if sown earlier. In short, it is impossible to lay down any exact rules; but that deviation from local usage is sometimes useful, I myself had a notable example of in regard to this cotton at Shorapoor.

In the granitic formations of the western districts of India, there is a good deal of reddish loamy soil, consisting of decomposed felspar and granite, which is used for the early or “khurreef” crops of grain and pulse—*never for cotton*. I had tried early sowings of New Orleans in black soil, with bad success; and yet it appeared that greater moisture was necessary to its perfect development than could be obtained by sowing in August and September. I determined therefore (the last year that I was at Shorapoor, 1859–60), to try red soil with the plant. The result was most perfect success. The red soil seemed to suit this cotton far better than the black; the plant was not so high, perhaps, but it was much stronger, and more bushy, and the yield incomparably larger. It happened, too, that that year was scanty in supply of rain, and other native cotton was much affected; not so the field of New Orleans on red soil, which grew and flourished abundantly. This field had not been manured, and no particular pains was taken with ploughing it. The seed was thinly sown by the drill-plough, and twice weeded by hand; the plants being thinned at the same time. The field was sown early in June; it began to flower in six weeks, and ripe cotton was pulled in great plenty in the end of September; and from this time

till February, when I left, and hot weather had begun, the plant still bore a continuance of flowers and pods, which were, to me, truly surprising. If I had remained, I should have repeated the experiment on a much larger scale ; and it may, indeed, have been continued by the local farmers, who came from all parts of the district to look at what they could not believe from report. The produce of this field, which was sent to the Bombay Chamber of Commerce, was declared the "*best which had ever been sent of the American variety.*"

Another kind of cotton which, to my perception, seemed more suited to the climate of the Raecchore Dooab and Shorapoor—in short, to a dryer climate than Dharwar—is the Egyptian. An intelligent farmer of a village on the western frontier of Raecchore, had obtained some seed from a friend in the Dharwar Collectorate ; it proved to be of mixed qualities ; and having observed a difference between the plants, and that one kind in particular grew better than others, he saved the seed of it and sowed it separately the next year, giving also portions to other farmers of the same village. He asked me to come and look at it ; and as Dr. Forbes—who has gone to India with Mr. Heywood of Manchester for an inspection of cotton districts—was with me, we went together. The field was, indeed, most luxuriant ; the plants far asunder, breast high, and full of pods and flowers. I have no doubt that the result in yield was most satisfactory, and will encourage the farmers to persevere.

There are, however, prejudices among native farmers against the sowing of New Orleans cotton which are not easily overcome. The seed is not fitted for the food of cattle, like that of the native variety, which affords so much nourishment, and forms part of the value return to the cultivator—and there is difficulty about cleaning it. Many kinds of gins have been tried with varying success ; but whether from its great dryness in the gin, and consequently more brittle character, or from the staple being really shorter than in America, I cannot say ; but there is no doubt that the staple of all Dharwar-ginned American has been hitherto very much cut in ginning, and thereby reduced in value. After many experiments, I believe that a gin has been perfected upon the roller principle, of which Dr. Forbes is the inventor, and which promised to effect all that was desired in the improvement of the staple. It could also be made applicable to native cotton. New Orleans cotton can, however, be very well cleaned by the native hand-churka, a small gin with rollers working different ways, sometimes both of hard

wood, sometimes one of wood and one of iron. What I sent last from Shorapoor, the produce of my red-soil field, was entirely cleaned by the common churka, and was very much admired. Such a gin, however, as Dr. Forbes's is an actual necessity in the country. A factory or company would have to supply many to the people, and keep up many itself; and, under proper treatment in cleaning, the indigenous cotton of Berar would, I believe, be the best in India.

It is excellent in colour, both Bhunnee and Jhurree, and the staple of both is longer and finer than any indigenous cotton with which I am acquainted; but stored badly, picked and cleaned badly, exposed to dust, which, in Berar, is hardly to be conceived, packed badly, and finally carried badly to the coast, it is no wonder then that Berar cotton hitherto has had a bad reputation.

Within the last four years, however, there is much improvement. Officers of Government have used their utmost endeavours to induce the adoption of careful picking when the cotton is ready, not too ripe and falling from the pods, or catching all the dust which blows upon it. The storing in "kulls" or enclosed spaces near villages, to be kept till the rent was settled with exacting talookdars, is also at an end. The rent now to be paid is settled beforehand, and the Ryot can take his produce as he pleases. Above all, the farmer has come to learn that there is a better price to be got from the purchasing agent for really good cotton than for bad, and he is beginning, in Berar to take pains about the preparation of it for market. In this respect the operation of a company would be of great benefit. It would either receive the cotton in the seed and clean it in its own gins, or it would supply gins to certain localities and take the cotton as cleaned. It would maintain discrimination between good and bad cotton, and it would soon be perceived by the people, that to get the best procurable price, the best article must be furnished; not as before in quantity, without any reference whatever to quality or condition, but with reference to quality.

And as I have before stated, the principle of buying only good produce would apply to all other articles of local growth, irrigated and non-irrigated.

Another important point to be considered is, that advances, if required by the people, would be given them by a Company on much lower terms than those they now get from local merchants and petty bankers. The manner in which the Marwarree traders of Berar make up accounts with their constituents is curiously complex, and very ruinous to the people; yet to some extent,—a

great extent, indeed,—the advances are necessary. I need not enter here into a subject which in itself has a peculiar and separate interest; but while some progress has been made by the Berar farmers to independence of the petty village banker or merchant, a great deal of necessity exists for continuance of prepayment, or loans upon time bargains. The lender is everywhere under the protection of the local law, which is not complex, nor is justice difficult of attainment. One great object of the present administration, indeed, has been to make justice as easily attainable as possible. There is no special law of contract existent; but the section “upon contracts,” which forms part of Mr. Temple’s Punjab Code, is administered in the province with success. I can state also, from my own judicial experience, that disputes about agricultural loans are comparatively very rare, and it is evident that the Ryots will rather stand a good deal of extra squeezing by the Marwarree lender, than apparently break faith with him by going to law. There are however, of course, occasional breaches of faith, and undoubtedly instances of extortion, also, which cannot be endured. Were a Company to make advances, it would do so judiciously, and under proper agreements; nor need the interest be higher than absolutely to protect the Company from loss. It would look to its profits upon the produce obtained, rather than to interest upon loans.

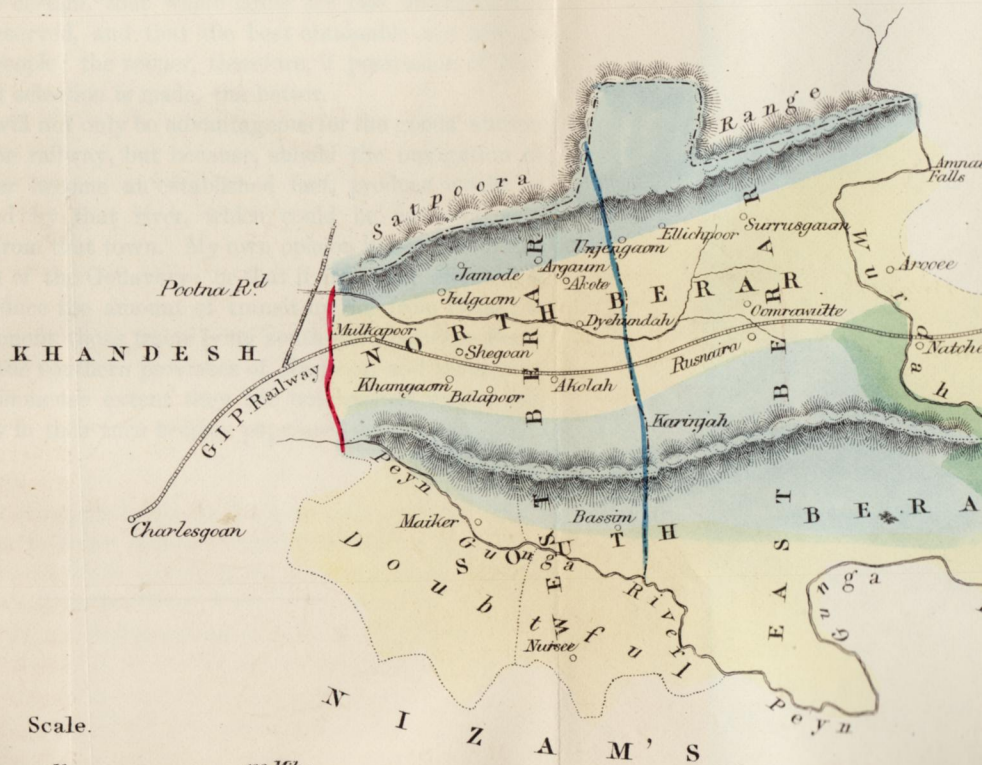
Another branch of employment of capital with profit, would be the direct importation of English fabrics for the supply of retail dealers of the district. Indeed retail sales might be established if possible. At present the Presidency is the only place in which cloths, cotton, and woollen can be obtained. But the large warehouses of a Company might always be stocked for the supply of the country at large, with advantage to itself and corresponding advantage to the people; and as cloths locally used and prepared could be obtained in the country and sent home for imitation, the exact quality, colour, and form could be imitated. I conceive that this would become a large and profitable branch of its business.

The main agency should be at Oomrawutte. I hear no complaints about its climate, but many of that of Akôla; and I know personally that Oomrawutte is pleasant for the greater part of the year. It is here that screwing-presses should be established; machinery for making “gunny” for bags, and cordage for the bales, when pressed. The railway will be open, it is said, in another twelve months, or at most eighteen months more; and by that time the Company’s buildings, warehouses, screw-presses, and the

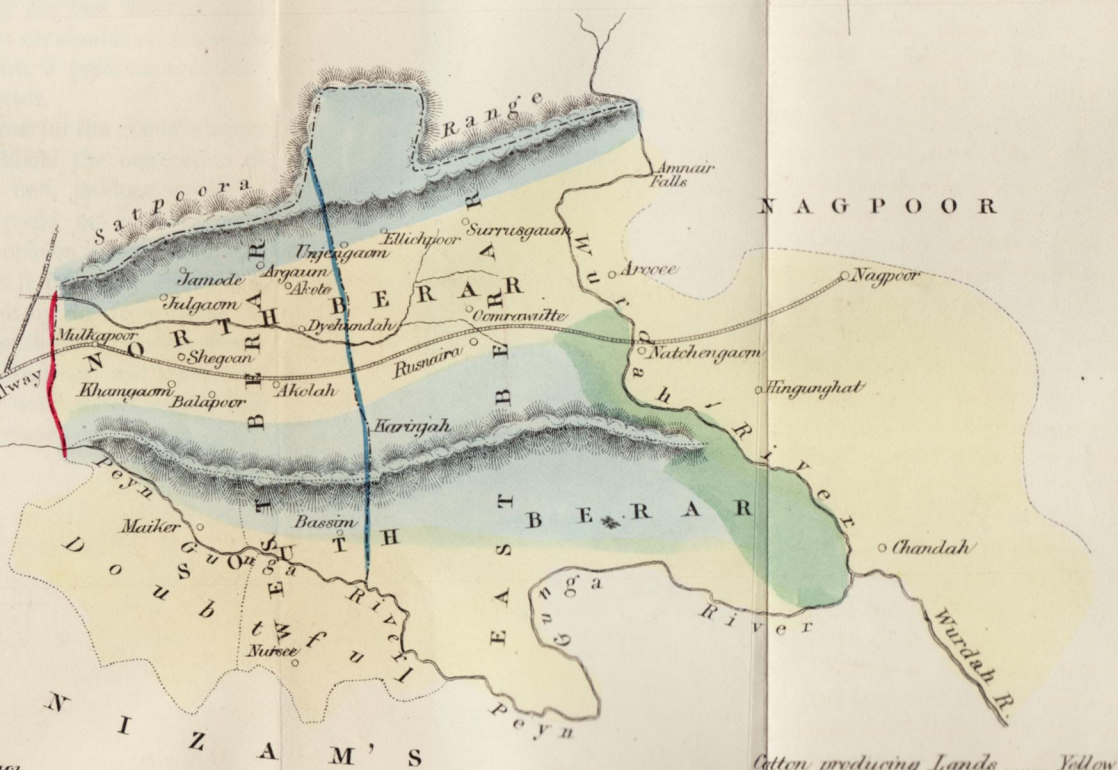
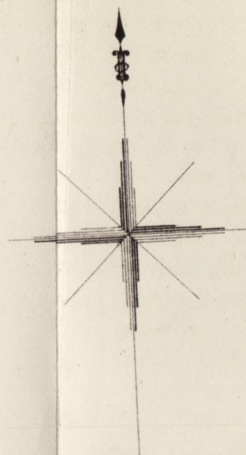
like plant, could be prepared; and those connections established between respectable farmers and local dealers, which would be indispensable. If it be desired to purchase land on the terms of the new Act, the tract on the right bank of the Wurdah could be examined and reported upon; as also waste lands near the River Poornah in the centre of the valley, eastward of Toogaom, in the Pergunna of that name; as also in other Talooks and Pergunnas adjacent to Oomrawutte. Much of the land has already been taken up and cleared; but some may still remain. The whole is of the finest quality. In short, an active agent, acting in concert with the Deputy Commissioners of the Berar Provinces, could, I have no doubt, secure waste lands wherever they were obtainable; and, whether cultivated directly by the Company, or rented for *produce*, to native farmers, they would be equally advantageous; but this much is certain, that waste lands are fast disappearing, that none are reserved, and that the best obtainable are always selected by the people: the sooner, therefore, if possession of land be an object, that selection is made, the better.

Oomrawutte will not only be advantageous for the goods' station on account of the railway, but because, should the navigation of the Godavery ever become an established fact, produce would be easily transmitted by that river, which could be comparatively quickly reached from that town. My own opinion is not favourable to the navigation of the Godavery; or that if it is ever effected, it will materially reduce the amount of transit by rail from Berar; it may, however, benefit those tracts lying south-east between Berar and the sea and the southern provinces of Nagpoor, and though at present, for an immense extent they are uninhabited wastes and forests, they may in their turn become populated countries.

Sketch OF EAST AND WEST BERAR



etch F ND WEST RAR



Cotton producing Lands Yellow
 Not Do Do Grey
 Waste Do Green